

Supporting Information for:

Nonionic fluorosurfactant as an ideal candidate for one-step
modification of gold nanorods

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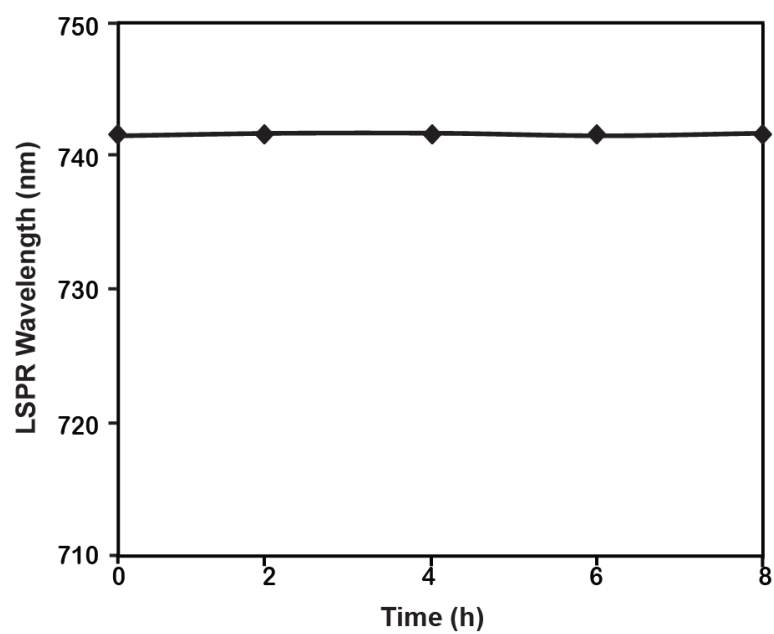


Fig. S1 Time dependence of the LSPR peak position after the gold nanorods were centrifuged at an etching time for 6 hours.

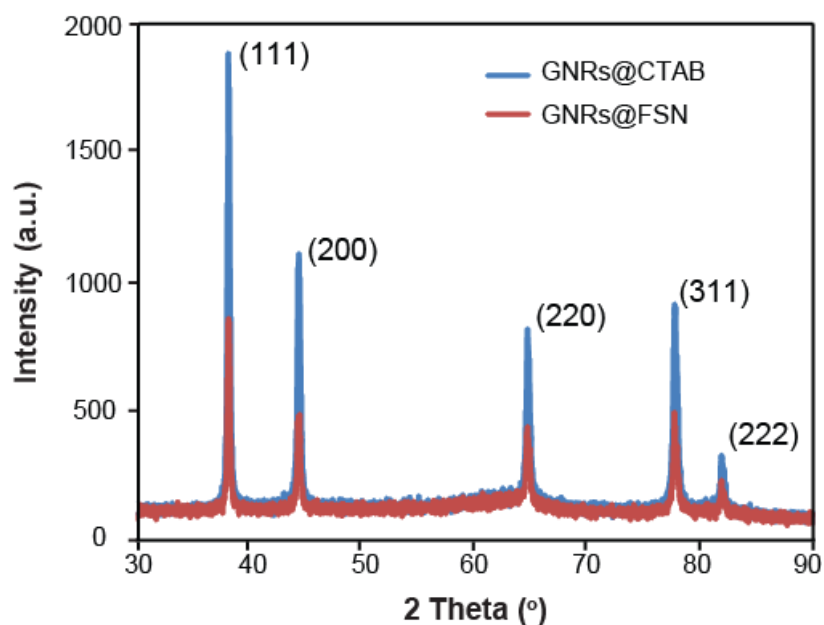


Fig. S2 XRD patterns of the GNRs@CTAB and the GNRs@FSN deposited on a glass substrate.

In Fig. S2, X-ray diffraction analysis of the GNRs@CTAB and the GNRs@FSN showed peaks in the 2θ range of 30-90° at 38.2°, 44.4°, 64.7°, 77.7°, and 81.4° assigned to the (111), (200), (220), (311) and (222), indicating the face centered cubic crystalline structure of the gold nanorods. At the same time, the diffraction peaks seemed narrow and pointed, indicating good and unitary crystal type.

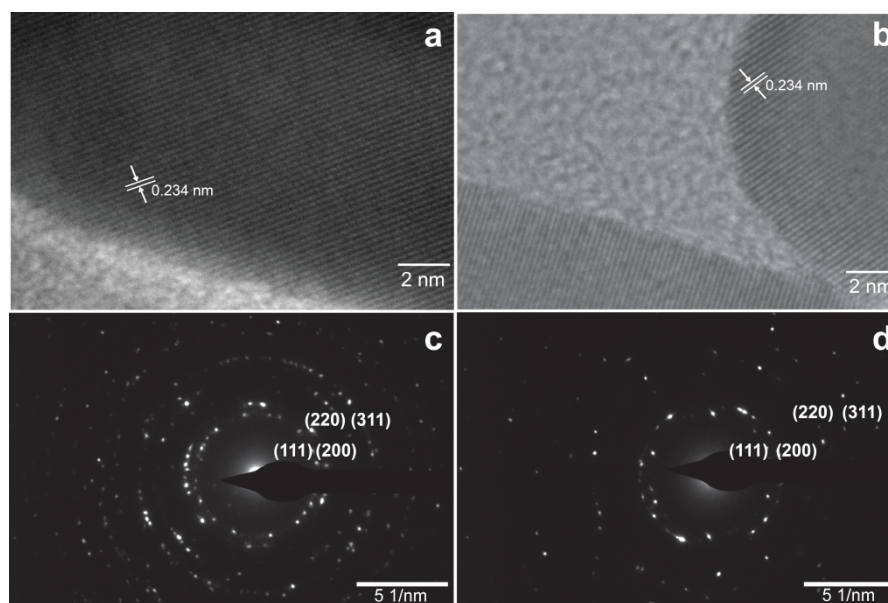


Fig. S3 (a) HRTEM image of the GNRs@CTAB. The measured distance is the distance of (111); (b) HRTEM image of the GNRs@FSN. The measured distance is the distance of (111); (c) The corresponding electron diffraction pattern of the GNRs@CTAB; (d) The corresponding electron diffraction pattern of the GNRs@FSN.

Fig. S3 shows the HRTEM images and SAED of the GNRs@CTAB and the GNRs@FSN. The lattice spacing measured from Figure S3a and Figure S3b were about 0.234 nm, corresponding to the d_{111} of Au. Figure S3c and Figure S3d, shows the electron diffraction of the gold nanorods. The diffraction rings correspond to (111), (200), (220) and (311) from the center to the outside, respectively. The SAED of the gold nanorods before treatment with FSN revealed narrow continuous rings, which are ascribed to the fcc structure of polycrystalline gold. While the SAED pattern of the gold nanorods after treatment with FSN displayed (111) continuous and (200) broken rings with diffraction points ascribed to (220), (311) facets indicating an increasing number of crystals with similar orientation.

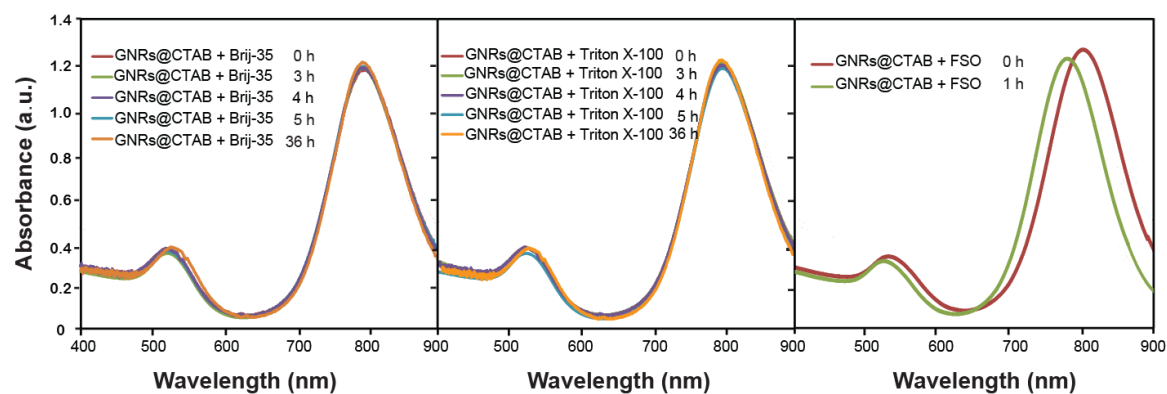


Fig. S4 UV-vis absorption spectra of the GNRs@CTAB after they were treated with 0.2% Brij-35, 0.2% Triton X-100 and 0.2% FSO for different time.

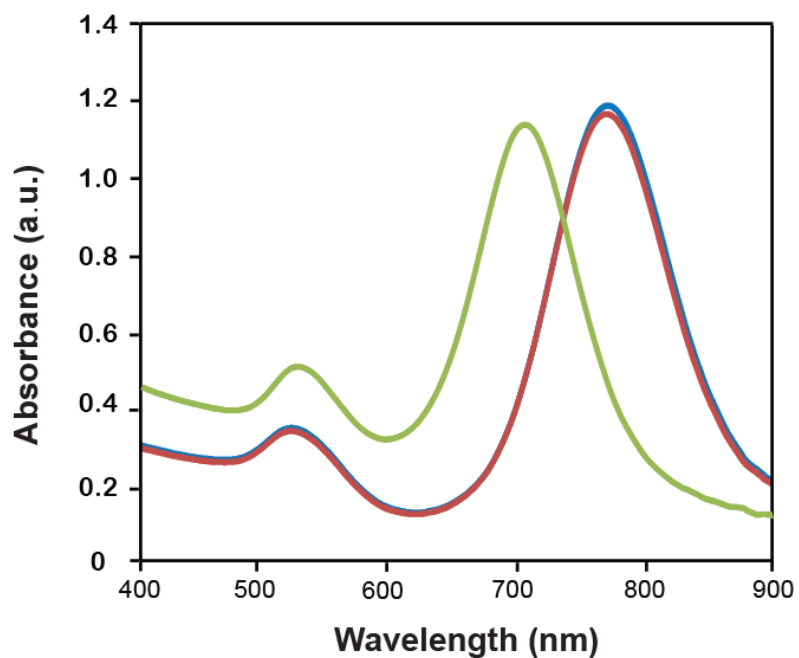


Fig. S5 UV-vis absorption spectra of GNRs@CTAB after they were centrifugated for three times (blue line), the centrifugal GNRs@CTAB with 0.2% FSN for 6 hours (red line) and the centrifugal GNRs@CTAB with 0.2% FSN and 0.1 mM H_{Au}Cl₄ for 6 hours (green line).

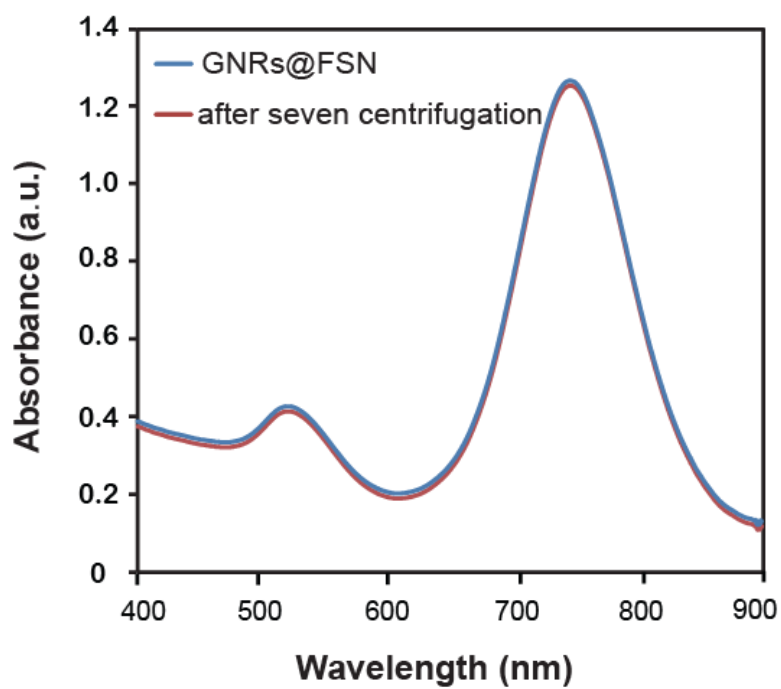


Fig. S6 UV-vis absorption spectra of the GNRs@FSN colloidal solution and after seven purification steps by high-speed centrifugation and re-dispersion into pure water.

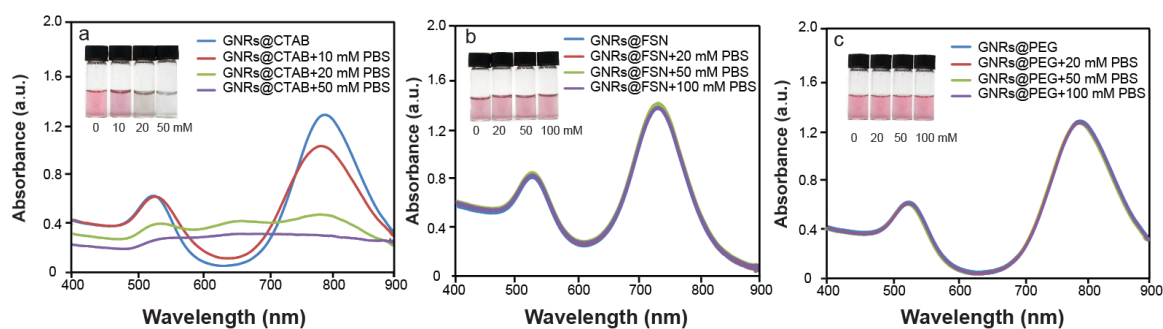


Fig. S7 (a) UV-vis absorption spectra of the GNRs@CTAB, the GNRs@CTAB with 10 mM PBS, the GNRs@CTAB with 20 mM PBS, and the GNRs@CTAB with 50 mM PBS; (b) UV-vis absorption spectra of the GNRs@FSN, the GNRs@FSN with 20 mM PBS, the GNRs@FSN with 50 mM PBS, and the GNRs@FSN with 100 mM PBS; (c) UV-vis absorption spectra of the GNRs@PEG, the GNRs@PEG with 20 mM PBS, the GNRs@PEG with 50 mM PBS, and the GNRs@PEG with 100 mM PBS. Inset: pictures of the GNRs@CTAB, GNRs@FSN and GNRs@PEG at different PBS concentrations.

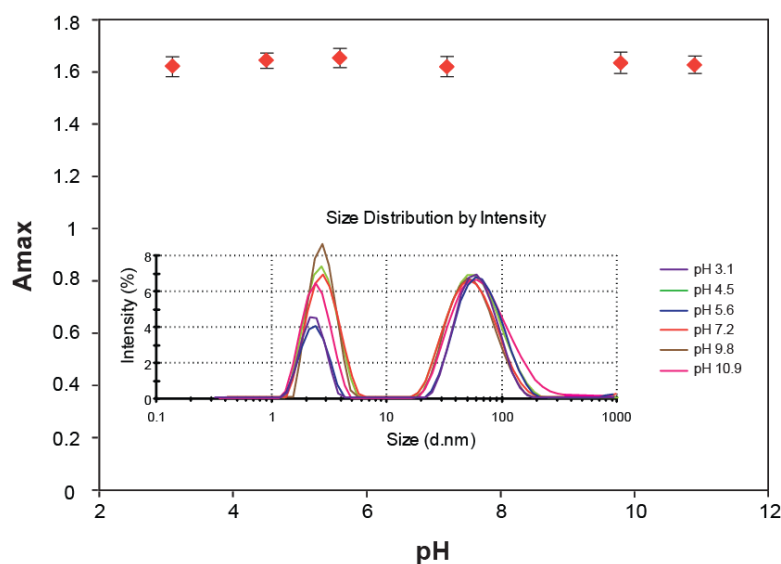


Fig. S8 Influence of the pH values on the maximum absorbance (A_{max}) of the GNRs@FSN. Inset: intensity-averaged size distribution plots of the GNRs@FSN at different pH. Peaks below 10 nm are due to rotational diffusion and have been omitted from size distribution analysis. Traces are based on a minimum of 13 measurements per sample.